Space Weather Forecast

Issued on Friday, 03 May 2024 at 01:44 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

Space Weather Forecast Headline: Further Moderate-class flares likely with a chance of Strong flares through the period. Possible Minor storms early today and again later in the period.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity is at Moderate levels, due to Moderate class flare from a region in the southeast quadrant. There are currently eight sunspot regions on the visible disc. Of these two are magnetically complex and also moderately large, both in the eastern hemisphere, one of which continues to develop in size and spot number.

A filament (arc of the Sun's plasma) eruption beginning at 01/0600 UTC close to the large sunspot in the southwest disc resulted in a notable Coronal Mass Ejection (CME) signature in coronagraph imagery. Further analysis has revealed a possible Earth-directed component late tomorrow, but more likely early on day 3 (5th). A region in the northeast emitted two narrow CME's, but these are currently not expected to be Earth directed. Neither are the several CME's which the active region in the southeast has produced.

Solar Wind / Geomagnetic Activity: The arrival of an unexpected CME (Coronal Mass Ejection) lead the solar wind speed to increase from background levels to become slightly elevated, and for the strength of the magnetic field to increase from moderate to strong levels. The important north-south component become negative for much of the time, reaching strongly negative values. The resultant geomagnetic activity was Quiet at first, increasing to reach Strong geomagnetic storm levels later in the day.

Energetic Particles / Solar Radiation: Solar radiation was at background levels.

Four-Day Space Weather Forecast Summary

Solar Activity: Moderate solar activity is expected to continue with further Moderate flares expected, and a slight chance of Strong flares. The magnetically complex regions in the eastern hemisphere, plus returning regions likely to rotate onto the disc later in the period, are potential sources of significant flares.

Solar Wind / Geomagnetic Activity: The solar wind environment is still currently influence by residual CME affects, which are expected to gradually diminish through today. However, there is a chance of a glancing blow from a CME that left the Sun on the 29th, arriving sometime today (3rd). A more notable CME that left the Sun around 01/0600 UTC from the southwest disc is now expected to give a glancing blow either late tomorrow (4th) or more likely early on day 3 (5th). Coronal hole influence may increase wind speeds through today or tomorrow, possibly reaching elevated levels, and then persisting through day 3 (5th May), before possibly declining through day 4 (6th).

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Met Office Space Weather Forecast

Geomagnetic activity is expected to be Unsettled to Active for much of the forecast period, due to residual CME influence, new CME arrivals combined with coronal hole influence. There is also a chance of Minor geomagnetic storm intervals, especially at first today and again late tomorrow into day 3 (5th). Later day 4 (6th) geomagnetic activity may decline to Quiet to Unsettled levels.

Energetic Particles / Solar Radiation: Solar radiation is most likely to remain at background levels through this period. There is a chance for an S1/Minor Storm or greater event, should any proton-rich flares occur, primarily from the large, complex sunspot group near the west limb before it rotates onto the far side.

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	Yes	70	50	50	30
Strong	G3	Yes	10	10	10	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	75	60	60	60
Very Active	R3 to R5 X	No	15	10	10	10

Solar Radiation Storms - (High Energy Protons):

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Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	**≥ S1**	No	20	10	5	1
Very Active	**≥ S3 ***	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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